

Claims

I claim:

- 5 1. An actuator device self-contained within a housing and adapted to move an object, the actuator device comprising:
- a movable piston positioned in a cylinder portion of the housing, the cylinder portion defining a longitudinal axis, the piston being movable along the longitudinal axis in response to an accumulation of air pressure within the cylinder portion;
- 10 a rod coupled to the piston for movement with the piston, the rod at least partially extending outside of the housing to couple to the object; and
- an air compressor located within the housing, the air compressor transferring air from a location in the housing outside the cylinder portion to a location inside the cylinder portion.
- 15 2. The actuator device of Claim 1, further comprising a valve selectively fluidly connecting the location inside the cylinder portion and the location in the housing outside the cylinder portion.
- 20 3. The actuator device of Claim 2, wherein the valve selectively fluidly connects the location inside the cylinder portion and the location in the housing outside the cylinder portion to vent the air pressure from the cylinder portion.
4. The actuator device of Claim 2, wherein the valve comprises a solenoid valve
- 25 selectively actuated by an electrical power source.

5. The actuator device of Claim 4, further comprising a switch selectively electrically connecting the solenoid valve and the power source.

6. The actuator device of Claim 1, further comprising
5 a main power switch electrically connected with a power source; and
a limit switch positioned within the housing adjacent the piston such that selective movement of the piston triggers the limit switch, the limit switch selectively electrically connecting the air compressor and the main power switch, wherein the main power switch selectively electrically connects the air compressor and the power source to
10 operate the air compressor.

7. The actuator device of Claim 1, wherein the rod is integrally formed with the piston.

8. An actuating system comprising:
an actuator device self-contained within a housing, the actuator device
including
a movable piston positioned in a cylinder portion of the housing, the
5 cylinder portion defining a longitudinal axis, the piston being movable along the
longitudinal axis in response to an accumulation of air pressure within the cylinder
portion,
a rod coupled to the piston for movement with the piston, the rod at
least partially extending outside of the housing to couple to the object, and
10 an air compressor located within the housing, the air compressor
transferring air from a location in the housing outside the cylinder portion to a
location inside the cylinder portion; and
an object coupled to a portion of the rod outside of the housing, the object
being moved in response to movement of the piston.

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9. The actuator device of Claim 8, further comprising a valve selectively fluidly
connecting the location inside the cylinder portion and the location in the housing outside the
cylinder portion.

20 10. The actuator device of Claim 9, wherein the valve selectively fluidly connects
the location inside the cylinder portion and the location in the housing outside the cylinder
portion to vent the air pressure from the cylinder portion.

11. The actuator device of Claim 9, wherein the valve comprises a solenoid valve
25 selectively actuated by an electrical power source.

12. The actuator device of Claim 11, further comprising a switch selectively electrically connecting the solenoid valve and the power source.

13. The actuator device of Claim 8, further comprising
5 a main power switch electrically connected with a power source; and
a limit switch positioned within the housing adjacent the piston such that
selective movement of the piston triggers the limit switch, the limit switch selectively
electrically connecting the air compressor and the main power switch, wherein the main
power switch selectively electrically connects the air compressor and the power source to
10 operate the air compressor.

14. The actuating system of Claim 8, wherein the object includes a lever for a
clutch/brake assembly, wherein actuation of the lever causes engagement and disengagement
of the clutch/brake assembly, and wherein the rod is coupled to the lever to engage and
15 disengage the clutch/brake assembly in response to movement of the rod.

15. The actuating system of Claim 14, further comprising a spring coupled
between the rod and the lever.

20 16. The actuating system of Claim 8, wherein the object includes an idler pulley of
a pulley system, wherein the idler pulley is selectively actuated to engage and disengage a
belt in the pulley system.

17. The actuating system of Claim 8, wherein the object includes a powered
25 implement carried by a motorized vehicle.

18. The actuating system of Claim 17, wherein the implement includes a mower deck carried by a riding lawnmower, and wherein the actuator device is configured to raise and lower the mower deck relative to a mowing surface traveled by the riding lawnmower.

19. An actuating system comprising:

an actuator device including

a housing,

a piston coupled to the housing by a flexible membrane, the flexible

5 membrane dividing the housing into a first chamber and a second chamber fluidly separated from the first chamber, the piston being responsive to an accumulation of air pressure within the housing,

a rod coupled to the piston for movement with the piston, the rod at least partially extending outside of the housing,

10 an air compressor fluidly connected with the first chamber of the housing, the air compressor being operable to generate the air pressure within the first chamber of the housing, and

a valve selectively fluidly connecting the first chamber and a location outside of the housing to vent the air pressure from the first chamber; and

15 an object coupled to a portion of the rod outside of the housing, the object being moved in response to movement of the piston.

20. The actuating system of Claim 19, wherein the valve comprises a solenoid valve selectively actuated by an electrical power source.

21. The actuating system of Claim 20, further comprising a switch selectively electrically connecting the solenoid valve and the power source.

22. The actuating system of Claim 19, further comprising:

a main power switch electrically connected with a power source; and

a limit switch positioned adjacent the piston such that selective movement of the piston triggers the limit switch, the limit switch selectively electrically connecting the air compressor and the main power switch, wherein the main power switch selectively electrically connects the air compressor and the power source to operate the air compressor.

23. The actuating system of Claim 19, wherein the object includes a lever for a clutch/brake assembly, wherein actuation of the lever causes engagement and disengagement of the clutch/brake assembly, and wherein the rod is coupled to the lever to engage and disengage the clutch/brake assembly in response to movement of the rod.

24. The actuating system of Claim 23, further comprising a spring coupled between the rod and the lever.

25. The actuating system of Claim 19, wherein the object includes an idler pulley of a pulley system, wherein the idler pulley is selectively actuated to engage and disengage a belt in the pulley system.

26. The actuating system of Claim 19, wherein the object includes a powered implement carried by a motorized vehicle.

27. The actuating system of Claim 26, wherein the implement includes a mower deck carried by a riding lawnmower, and wherein the actuator device is configured to raise and lower the mower deck relative to a mowing surface traveled by the riding lawnmower.